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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,275	12/23/2003	Vaidyanathan Balasubramaniam	071469-0306881	4465

909 7590 09/06/2005

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EXAMINER

NGUYEN, THANH T

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 09/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/743,275	Applicant(s) BALASUBRAMANIAM ET AL.	
	Examiner Thanh T. Nguyen	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 25-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/1/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's arguments filed 6/30/05 have been fully considered but they are not persuasive.

Applicants election with traverse of group I, claims 1-24 invention is acknowledged.

Requirement for restriction practice are set forth in MPEP&803.

There are two criteria for a proper requirement for restriction between patentable distinct inventions:

1. The inventions must be distinct as claimed (see MPEP && 806.05-806.05(i)); and
2. There must be a serious burden on the examiner if restriction is not required (see MPEP && 803.02, 806.04(a)-(j), 808.01(a) and 808.02).

The traversal is on the ground(s) that Invention I and II are related as process and system for its practice would not be a serious burden on the examiner. This is not found persuasive because method and product are statutorily distinct categories of invention, and the particular method claimed is distinct from the particular product claimed because there is an alternative method of making the device. Therefore, there is no reason why a search for the method must include a search for the device as well. The existence of an alternative method of making the device, as well as the different classification of two inventions, provide evidence of a burden on the examiner in examining both inventions.

Distinctness between a process of making and the product made is shown if the product as claimed can be made by another materially different process. MPEP&806.05(f). In the

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restriction requirement, the examiner set forth several materially different processes by which the claimed product could be made.

A serious burden on the examiner is shown according to the criteria of MPEP&808.02, where one of the following must be supported by appropriate explanation:

1. Separate classification thereof:

This shows that each distinct subject has attained recognition in the art as a separate subject for inventive effort, and also a separate field of search,. Patents need not be cited to show separate classification.

2. A separate status in the art when they are classifiable together;....
3. A different field of search....

In the restriction requirement of June 1, 2005, the examiner set forth separate classification for the two inventions to which claims were presented. Classification of the device claims in class 134. Classification of the process claims is in class 438. Applicant has not alleged that either device or process claims were improperly classified. Nor has applicant alleged that the classifications set forth are not Aseparate classifications. Thus, requirement 2 of MPEP&803 is met. For these reasons set forth above, the restriction requirement is proper.

The requirement is still deemed proper and is therefore made FINAL.

Information Disclosure Statement

The information disclosure statement filed on 6/1/05 has been considered.

Oath/Declaration

Oath/Declaration filed on 4/15/04 has been considered.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-9, 11-12, 14-18, 23-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhu et al. (U.S. Patent Publication No. 2005/0079710).

1. A method for removing photoresist from a substrate comprising:
disposing said substrate in a plasma processing system (100), said substrate having a dielectric layer (OSG/cap) formed thereon with said photoresist (PR) overlying said dielectric Layer (OSG/cap), wherein said photoresist provides a mask for etching a feature into said dielectric Layer (see figures 2-5j),
introducing a process gas comprising N_xO_y , wherein x and y are integers greater than or equal to unity (see figures 2, paragraph# 25+);
forming a plasma from said process gas in said plasma processing system (206, see figures 2, paragraph# 25+); and
removing said photoresist from said substrate with said plasma (208, see figures 2, paragraph# 29+);.

Regarding to claims 2, 15. introducing of said process gas comprises introducing at Least one of NO, NO₂, and N₂O (see paragraph# 25).

Regarding to claims 3, 16. introducing of said process gas further comprises introducing an inert gas (see paragraph# 25).

Regarding to claims 4, 17, introducing of said inert gas comprises introducing a Noble gas (see paragraph# 25).

Regarding to claims 5. disposing of said substrate having said dielectric Layer comprises disposing said substrate having a low dielectric constant dielectric Layer (see paragraph# 23).

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6. disposing of said substrate having said dielectric Layer comprises disposing said substrate having at Least one of a porous dielectric Layer, and a non-porous dielectric Layer (see paragraph# 23).

7. disposing of said substrate having said dielectric Layer comprises disposing said substrate having said dielectric Layer including at Least one of an organic material, and an inorganic material (see paragraph# 23).

8. disposing of said substrate having said dielectric Layer comprises disposing said substrate having said dielectric Layer including an inorganic-organic hybrid material (see paragraph# 23).

9. disposing of said substrate having said dielectric layer comprises disposing said substrate having said dielectric layer including an oxidized organo silane (see paragraph# 23).

11. disposing of said substrate having said dielectric Layer comprises disposing said substrate having said dielectric Layer including a silicate-based material (see paragraph# 23).

12. disposing of said substrate having said dielectric Layer comprises disposing said substrate having said dielectric Layer including a collective film including silicon, carbon, and oxygen (see paragraph# 23).

14. A method of forming a feature in a dielectric layer on a substrate comprising:

forming said dielectric Layer (OSG) on said substrate,

forming a photoresist pattern (PR) on said dielectric Layer;

transferring said photoresist pattern to said dielectric Layer by etching (see fig. 3a+), and

removing said photoresist from said dielectric Layer using a plasma formed with a process gas comprising N_xO_y , wherein x and y are integers greater than or equal to unity (see fig. 2+, paragraph# 25).

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18. removing of said photoresist is performed for a first period of time (see paragraph# 2+).
23. transferring of said photoresist pattern to said dielectric Layer by etching is performed in a plasma processing system, and said removing of said photoresist from said dielectric Layer is performed in said plasma processing system(100, see paragraph# 25+, figures 2+).
24. transferring of said photoresist pattern to said dielectric Layer by etching is performed in a plasma processing system, and said removing of said photoresist from said dielectric Layer is performed in another plasma processing system (see figures 2+, paragraph# 25+).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 10, 13, 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. (U.S. Patent Publication No. 20050079710) as applied to claims 1-9, 11-12, 14-18, 23-24 in view of Mukherjee-Roy et al. (U.S. Patent Publication No. 2003/0216026) and Bao et al. (U.S. Patent Publication No. 2005/0130411).

Zhu et al. teaches a method of stripping photoresist film on the organosilicate glass dielectric layer. However, the reference does not teach the dielectric Layer including at Least one of hydrogen silsesquioxane, and methyl silsesquioxane, disposing hydrogen in collective

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film, removing of photoresist determined by endpoint detection comprises utilizing optical emission spectroscopy.

Mukherjee-Roy et al. teaches a method of forming an opening in the dielectric layer wherein the dielectric Layer including at Least one of hydrogen silsesquioxane, and methyl silsesquioxane, disposing hydrogen in collective film (see paragraph# 25, and claim 5).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would form dielectric Layer including at Least one of hydrogen silsesquioxane, and methyl silsesquioxane, disposing hydrogen in collective film in process of Zhu et al. as taught by Mukherjee-Roy et al. because the low dielectric constants to prevent problems with capacitance, cross talk, between adjacent conducting layers and elements.

Bao et al. teaches removing of photoresist determined by endpoint detection comprises utilizing optical emission spectroscopy (see paragraphs# 45, 54).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made to removing the layer determined by endpoint detection comprises utilizing optical emission spectroscopy in process of Zhu et al. as taught by Bao et al. because the process would sense when the removing process complete to terminate the flow of the plasma gas.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Nguyen whose telephone number is (571) 272-1695, or by

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Email via address Thanh.Nguyen@uspto.gov. The examiner can normally be reached on Monday-Thursday from 6:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, can be reached on (571) 272-1702. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 (**See MPEP 203.08**).

A handwritten signature in black ink, appearing to read 'Thanh', with a long horizontal stroke extending to the left and a smaller loop to the right.

Thanh Nguyen
Patent Examiner
Patent Examining Group 2800

TTN